

minal in the alternator connector (A, **Figure 23**). There should be no continuity (infinite resistance).

6. If the alternator fails either of these tests, the stator assembly must be replaced.

7. Apply Dielectric Compound (available from a Honda dealer) to the electrical connectors prior to reconnecting them. This will help seal out moisture.

8. Make sure the electrical connectors are free of corrosion and are completely coupled.

STARTING SYSTEM

The starting system consists of the starter motor, starter gears, solenoid and the starter button.

The layout of the starting system is shown in **Figure 24**. When the starter button is pressed, it engages the starter solenoid switch that completes the circuit allowing electricity to flow from the battery to the starter motor.

CAUTION

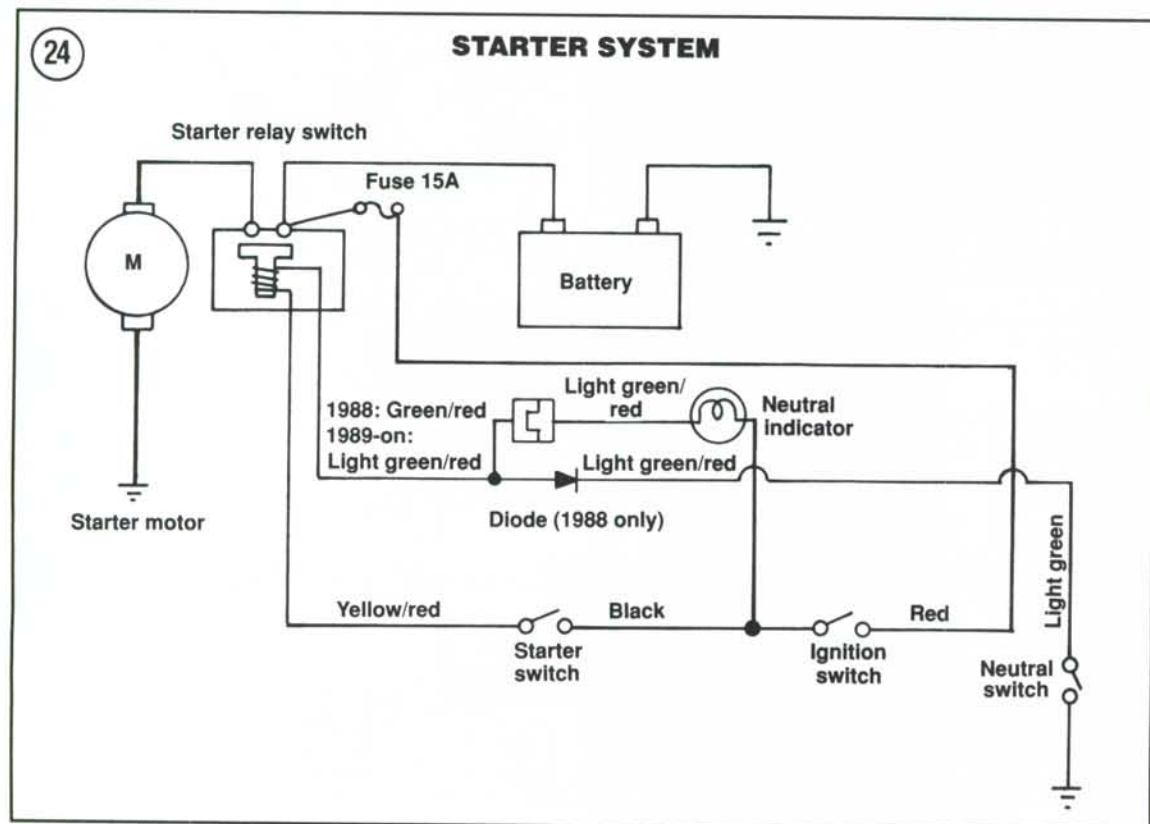
Do not operate the starter for more than 5 seconds at a time. Let it rest approximately 10 seconds, then use it again.

The starter gears are covered in Chapter Four. **Table 2** lists possible starter problems, probable causes and most common remedies.

STARTER

Removal/Installation

1. Place the vehicle on level ground and set the parking brake.
2. Remove the seat.
3. Remove the bolts (A, **Figure 25**) and remove the battery box cover (B, **Figure 25**).
4. Disconnect the battery negative lead (**Figure 26**).
5. Remove the starter reduction gears as described under *Starter Reduction Gears Removal/Installation* in Chapter Four.
6. Pull back the rubber boot on the electrical connector.
7. Disconnect the black electric starter cable from the starter (A, **Figure 27**).



8. Remove the bolts (B, **Figure 27**) securing the starter to the top of the crankcase.

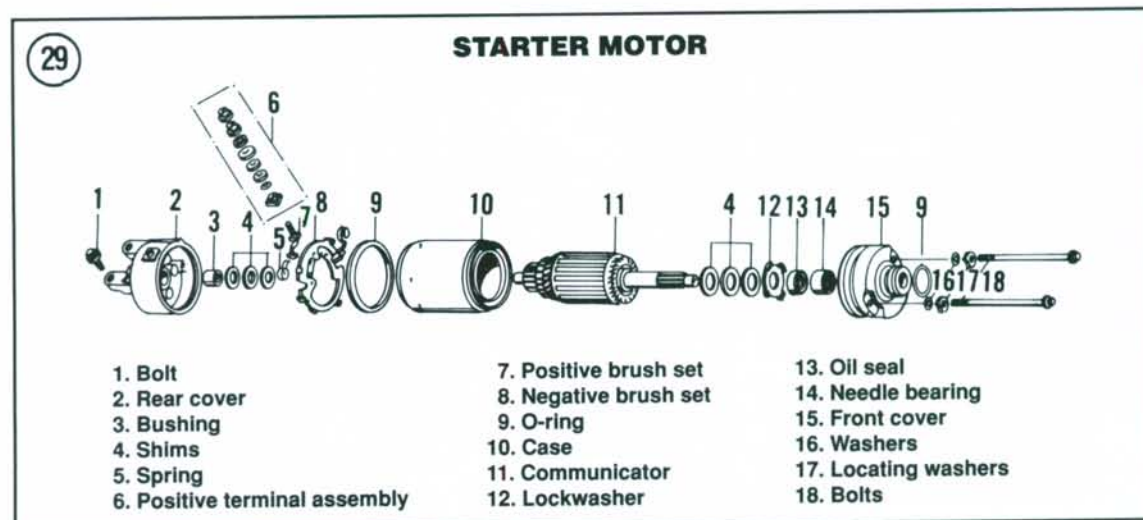
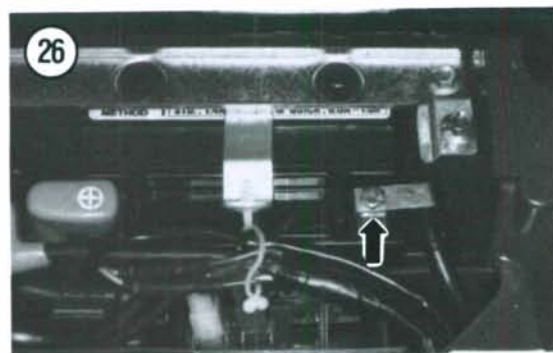
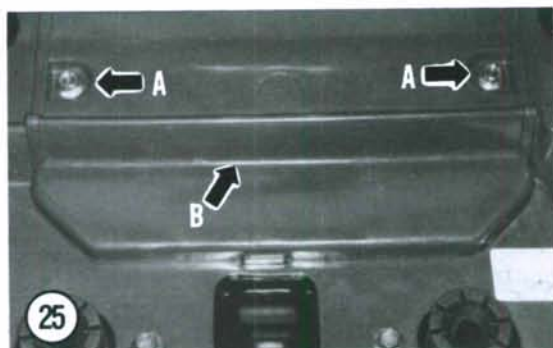
9. Lift up on the right-hand side of the starter and pull the starter toward the right just enough to retract the starter gear from the left-hand crankcase cover.

10. Pull the starter up and out through the left-hand side.

11. Install by reversing these removal steps. Make sure the electrical connector is free of corrosion and is tight.

Preliminary Inspection

The overhaul of a starter motor is best left to an expert. This procedure shows how to detect a defective starter.





Inspect the O-ring seal (A, **Figure 28**). O-rings tend to harden after prolonged use and heat and therefore lose their ability to seal properly. Replace as necessary.

Inspect the gear teeth (B, **Figure 28**) for chipped or missing teeth. If damaged, the starter assembly must be replaced.

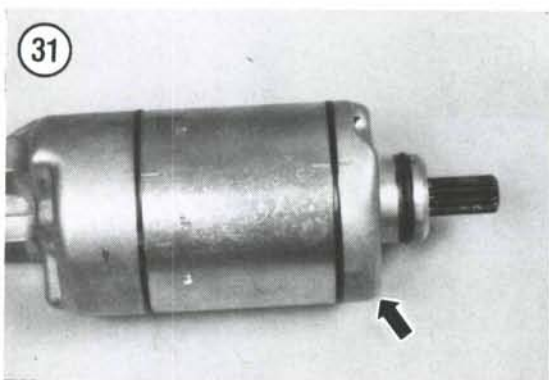
Disassembly

Refer to **Figure 29** for this procedure.

1. Remove the 2 case screws, washers and lockwashers (**Figure 30**).

NOTE

Write down the number of shims used on the shaft next to the commutator and next to the rear cover. Be sure to install the same number when reassembling the starter.



2. Slide the front cover (**Figure 31**) off of the armature shaft.

3. Remove the lockwasher (**Figure 32**) from the armature shaft.



4. Slide the shims (**Figure 33**) off of the armature shaft. Record the number of shims and their location. Store the shims in a marked plastic bag.

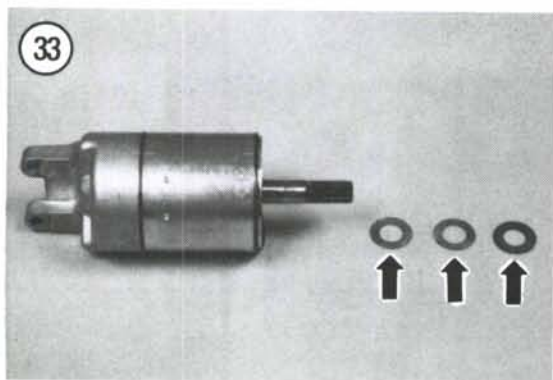
NOTE

Labeling and storing these shims removed in Step 4 is important because other shims are also used on the opposite side of the armature.

NOTE

*The number of shims used in each starter varies. The starter shown in **Figure 33** uses 3 shims. The starter you are working on may use a different number of shims.*

5. Slide the case (**Figure 34**) off of the armature.
6. Slide the end cover (**Figure 35**) off of the armature.
7. Slide the shims off of the armature shaft. Record the number of shims and their location. Store the shims in a marked plastic bag.
8. Clean all grease, dirt and carbon from the armature, case and end caps.



CAUTION

Do not immerse the wire windings in the case or the armature coil in solvent as the insulation may be damaged. Wipe the windings with a cloth lightly moistened with solvent and thoroughly dry.

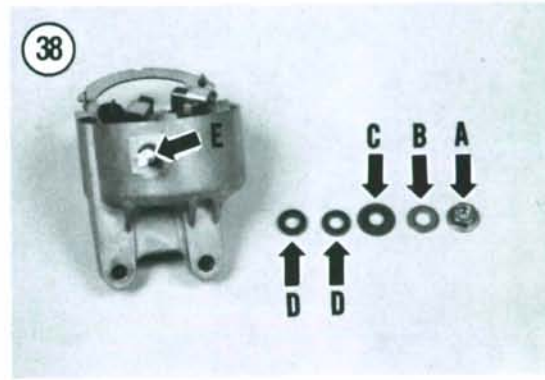
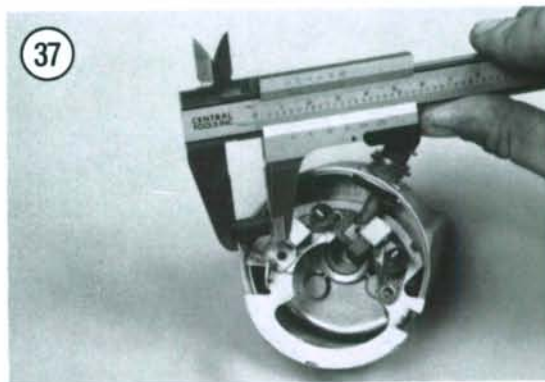
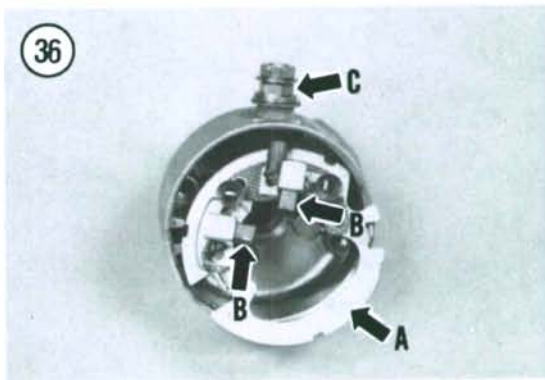
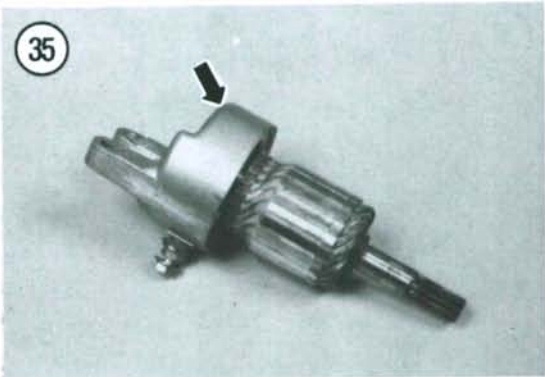
Inspection

1. Pull the brush holder assembly (A, **Figure 36**) out of the end cover and carefully turn it over to expose the brushes (B, **Figure 36**).
2. Pull the spring away from each brush (B, **Figure 36**) and pull the brushes out of their guides.
3. Measure the length of each brush with a vernier caliper (**Figure 37**). If the length is 6.5 mm (0.26 in.) or less for any one of the brushes, the brush holder assembly must be replaced. The brushes cannot be replaced individually.
4. To replace the brush holder assembly, perform the following:

NOTE

*The cable terminal assembly (C, **Figure 36**) is composed of 3 insulated washers, a regular washer and nut. Label each component when removed, especially the insulated washers, as they must be reinstalled in the same order to insulate the brushes from the case.*

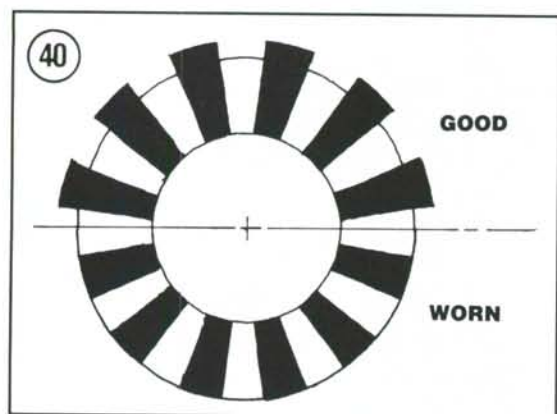
- a. Remove the nut (A, **Figure 38**) from the cable terminal and slide off the regular washer (B, **Figure 38**).
- b. Remove the large insulated washer (C, **Figure 38**) and the 2 small insulated washers (D, **Figure 38**).



39



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41



42



- c. Slide the O-ring (E, **Figure 38**) off of the cable terminal.
- d. Push the cable terminal into the end cover and remove the brush holder assembly.
- e. Install the brush holder assembly by reversing these removal steps. Make sure to install the nut and washers in their original order.

5. Inspect the commutator (**Figure 39**). The mica in a good commutator is below the surface of the copper bars. On a worn commutator, the mica and copper bars may be worn to the same level (**Figure 40**). If necessary, have the commutator serviced by a dealer or electrical repair shop.

6. Inspect the commutator copper bars for discoloration. If a pair of bars is discolored, grounded armature coils are indicated.

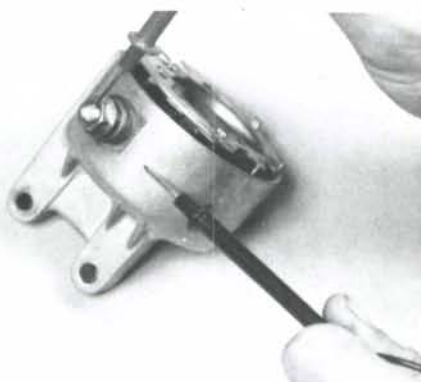
7. Use an ohmmeter and perform the following:

- a. Check for continuity between the commutator bars (**Figure 41**); there should be continuity between the pairs of bars.
- b. Check for continuity between the commutator bars and the shaft (**Figure 42**); there should be no continuity.
- c. If the unit fails either of these tests, the starter assembly must be replaced. The armature cannot be replaced individually.

8. Use an ohmmeter and perform the following:

- a. Check for continuity between the starter cable terminal and the end case cover (**Figure 43**); there should be no continuity.
- b. Check for continuity between the starter cable terminal and the brush black wire terminal (**Figure 44**); there should be continuity.

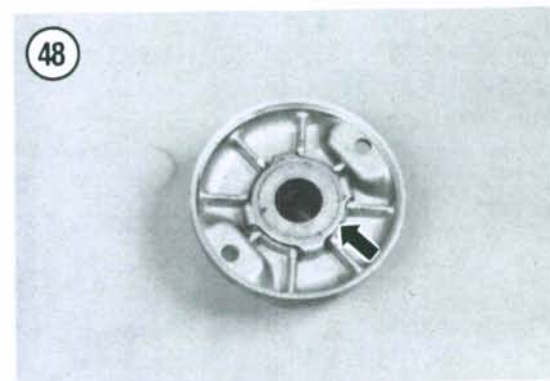
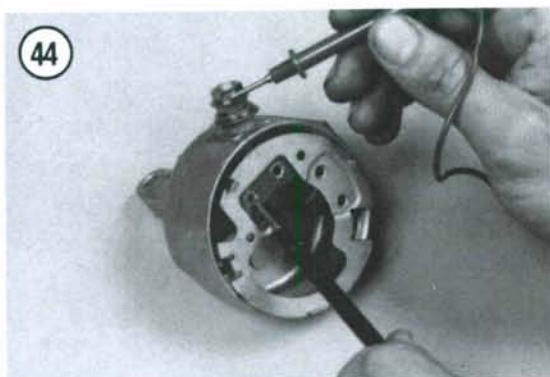
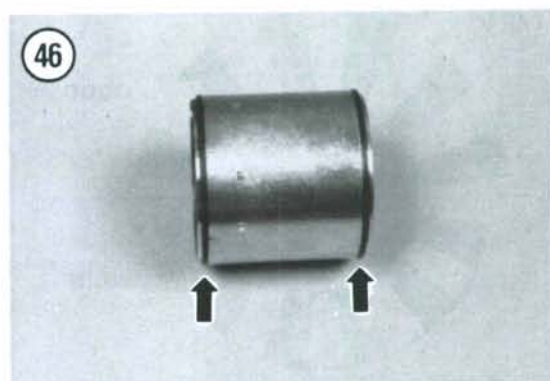
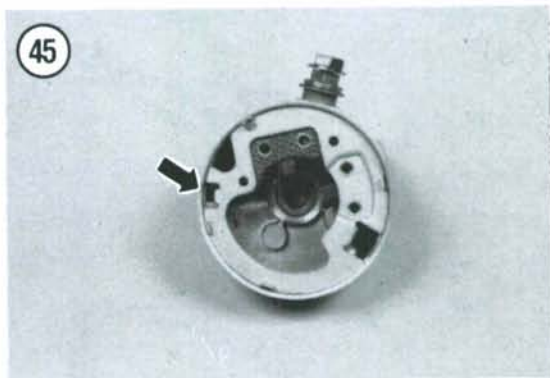
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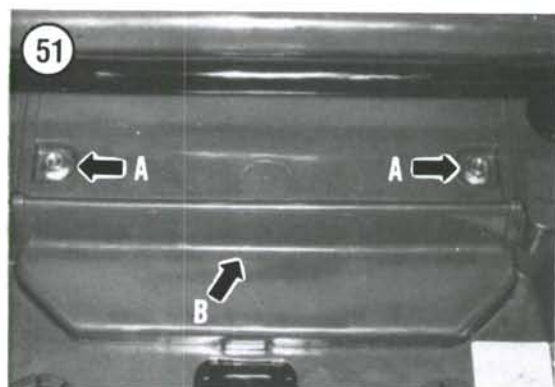
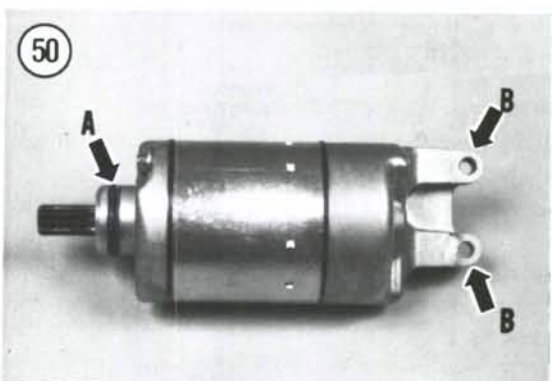
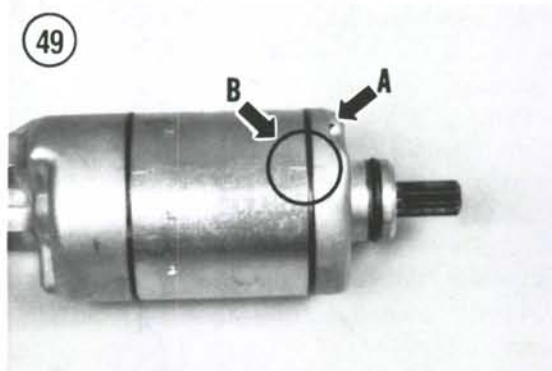


- c. If the unit fails either of these tests, the starter assembly must be replaced. The case/field coil assembly cannot be replaced individually.
9. Inspect the oil seal and bushing in the front cover for wear or damage. If either is damaged, replace the starter assembly as these parts are not available separately.
10. Inspect the bushing in the rear cover for wear or damage. If it is damaged, replace the starter assembly as this part is not available separately.

Assembly

1. If removed, install the brushes into their holders and secure the brushes with the springs.
2. Install the brush holder assembly in the rear cover. Align the holder locating tab with the notch in the rear cover (**Figure 45**).
3. Install the correct number of shims on the armature shaft next to the commutator.
4. Insert the armature coil assembly into the rear cover (**Figure 35**). Turn the armature during installation so the brushes engage the commutator properly. Make sure the armature is not turned upside down or the shims could slide off the end of the shaft. Do not damage the brushes during this step.
5. Make sure the two O-rings (**Figure 46**) are installed on the case. Then slide the case over the armature (**Figure 34**). Align the mark on the case and end cover (**Figure 47**).
6. Install the correct number of shims onto the armature shaft.
7. Install the lockwasher (**Figure 32**) onto the front cover so that the lockwasher tabs engage the cover slots (**Figure 48**).





8. Install the front cover (A, **Figure 49**) over the armature shaft. Align the marks on the front cover with the case (B, **Figure 49**).

9. Apply blue Loctite (No. 242) onto the case screw threads and install the screws, washers and lock-washers. Tighten the screws securely.

10. Replace the front cover O-ring seal (A, **Figure 50**) if deteriorated or damaged. Apply clean engine oil to the O-ring.

11. Clean the cover mounting lugs (B, **Figure 50**) of all dirt and other contaminants as they act as the ground for the starter motor.

STARTER SOLENOID

Testing

1. Remove the seat.
2. Shift the transmission to NEUTRAL.
3. Remove the bolts (A, **Figure 51**) and remove the battery box cover (B, **Figure 51**).
4. Turn the ignition switch ON.
5. Press the START button. The solenoid should click. If it does not click, proceed to Step 6.
6. Disconnect the solenoid 2-pin mini electrical connector (**Figure 52**).
7. Connect a 0-15 DC voltmeter between the yellow/red (+) and the green/red (-) terminals on the harness side of the mini electrical connector.
8. With the transmission still in NEUTRAL, have an assistant press the start button. There should be battery voltage indicated. If there isn't, proceed to Step 9.
9. Remove the starter solenoid as described in this chapter.
10. Connect a fully charged 12 volt battery to the electrical connector terminals.
11. Connect an ohmmeter between the positive and negative terminals on top of the solenoid and check for continuity. If there is continuity (low resistance) the solenoid is okay. If there is no continuity (infinite resistance), the solenoid is faulty and must be replaced.
12. If the starter solenoid is okay, reinstall the solenoid as described in this chapter, then reconnect the mini electrical connector.
13. Install all items removed.

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